

SEQUENCE LISTING

<110> Takeda Chemical Industries, Ltd.

<120> Betacellulin Mutein

<130> 2576W00P

<150> JP 10-350377

<151> 1998-12-09

<150> JP 11-55326

<151> 1999-03-03

<160> 56

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<212> PRT

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			20					25					30		
Gly	His	Phe	Ser	Arg	Cys	Pro	Lys	Gln	Tyr	Lys	His	Tyr	Cys	Ile	Lys
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Gly	Arg	Cys	Arg	Phe	Val	Val	Ala	Glu	Gln	Thr	Pro	Ser	Cys	Val	Cys
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			20					25					30		
Gly	His	Phe	Ser	Arg	Cys	Pro	Lys	Gln	Tyr	Lys	His	Tyr	Cys	Ile	Lys
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Gly	Arg	Cys	Arg	Phe	Val	Val	Ala	Glu	Gln	Thr	Pro	Ser	Cys	Val	Cys
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 Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp
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 Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val
 35 40 45

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 Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
 20 25 30
 Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
 35 40 45
 Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
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 Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu Phe Tyr
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 Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys

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Gly	Arg	Cys	Arg	Phe	Val	Val	Ala	Glu	Gln	Thr	Pro	Ser	Cys	Val	Cys				
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		20						25					30						
Gly	His	Phe	Ser	Arg	Cys	Pro	Lys	Gln	Tyr	Lys	His	Tyr	Cys	Ile	Lys				
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Gly	Arg	Cys	Arg	Phe	Val	Val	Ala	Glu	Gln	Thr	Pro	Ser	Cys	Val	Cys				
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		20						25					30						
Gly	His	Phe	Ser	Arg	Cys	Pro	Lys	Gln	Tyr	Lys	His	Tyr	Cys	Ile	Lys				
	35					40					45								
Gly	Arg	Cys	Arg	Phe	Val	Val	Ala	Glu	Gln	Thr	Pro	Ser	Cys	Val	Cys				
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			20					25					30				
Gly	His	Phe	Ser	Arg	Cys	Pro	Lys	Gln	Tyr	Lys	His	Tyr	Cys	Ile	Lys		
		35					40					45					
Gly	Arg	Cys	Arg	Phe	Val	Val	Ala	Glu	Gln	Thr	Pro	Ser	Cys	Val	Cys		
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Asp	Glu	Gly	Tyr	Ile	Gly	Ala	Arg	Cys	Glu	Arg	Val	Asp	Phe				
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 Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu Phe
 35 40 45
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 20 25 30
 Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu Phe
 35 40 45
 <210> 12
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 Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys
 20 25 30
 Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Leu
 35 40 45
 <210> 13
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<212> PRT

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Ile	Lys	Gly	Arg	Cys	Arg	Phe	Val	Val	Ala	Glu	Gln	Thr	Pro	Ser	Cys
			20				25					30			
Val	Cys	Asp	Glu	Gly	Tyr	Ile	Gly	Ala	Arg	Cys	Glu	Arg	Val	Asp	Phe
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<213> Artificial Sequence

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Ile	Lys	Gly	Arg	Cys	Arg	Phe	Val	Val	Ala	Glu	Gln	Thr	Pro	Ser	Cys
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Val	Cys	Asp	Glu	Gly	Tyr	Ile	Gly	Ala	Arg	Cys	Glu	Arg	Val	Asp	Phe
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CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGACGCCC
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CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGACGCCC
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 GCAAGGTGTG AGAGAGTTGA C
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 CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGACGCCC
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 120
 CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGACGCCC
 180
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 CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGACGCCC
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 TCCTGTGTCT GTGATGAAGG CTACATTGGA GCAAGGTGTG AGAGAGTTTT G
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 CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGACGCCC
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 CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGACGCCC
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 GCAAGGTGTG AGAGAGTTTT GTTTTAC
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 GCAAGGTGTG AGAGAGTTTT G
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22

<210> 33

<211> 26

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<400> 33

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26

<210> 34

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<212> DNA

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22

<210> 35

<211> 80

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<213> Human

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20 25 30

Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
35 40 45

Gly Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys
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Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Leu Phe Tyr
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120

CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGACGCCC
180

TCCTGTGTCT GTGATGAAGG CTACATTGGA GCAAGGTGTG AGAGAGTTGA CTTGTTTTAC

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 Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys Gly
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 His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys Gly
 35 40 45
 Arg Cys Arg Phe Val Val Ala Glu Gln Thr Pro Ser Cys Val Cys Asp
 50 55 60
 Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val
 65 70 75
 <210> 38
 <211> 53
 <213> Artificial Sequence
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 Lys Gln Tyr Lys His Tyr Cys Ile Lys Gly Arg Cys Arg Phe Val Val
 20 25 30
 Ala Glu Gln Thr Pro Ser Cys Val Cys Asp Glu Gly Tyr Ile Gly Ala
 35 40 45
 Arg Cys Glu Arg Val
 50 53
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<212> DNA

<213> Artificial Sequence

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<210> 42

<211> 225

<212> DNA

<213> Artificial Sequence

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TACAAGCATT ACTGCATCAA AGGGAGATGC CGCTTCGTGG TGGCCGAGCA GACGCCCTCC

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<211> 159

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159

<210> 44

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<400> 44

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5

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15

Ile Lys Gly Arg Cys Arg Phe Val Val Ala Glu Gln Asn Pro Ser Thr

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25

30

Pro Ser Cys Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg

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40

45

Val Asp Leu Phe Tyr

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 Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp Leu Phe Tyr
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 Asp Pro Glu Glu Asn Cys Ala Ala Thr Thr Thr Gln Ser Lys Arg Lys
 20 25 30
 Gly His Phe Ser Arg Cys Pro Lys Gln Tyr Lys His Tyr Cys Ile Lys
 35 40 45
 Gly Arg Cys Arg Phe Val Val Ala Glu Gln Asn Pro Ser Thr Pro Ser
 50 55 60
 Cys Val Cys Asp Glu Gly Tyr Ile Gly Ala Arg Cys Glu Arg Val Asp
 65 70 75 80
 Leu Phe Tyr
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 120
 CAATACAAGC ATTACTGCAT CAAAGGGAGA TGCCGCTTCG TGGTGGCCGA GCAGAACCCC
 180
 TCGACGCCCT CCTGTGTCTG TGATGAAGGC TACATTGGAG CAAGGTGTGA GAGAGTTGAC
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 TTGTTTTAC
 249
 <210> 48
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 TACATTGGAG CAAGGTGTGA GAGAGTTGAC TTGTTTTAC
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 120
 TGTGAGAGAG TTGACTTGTT TTAC
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